

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

ATTY. DOCKET NO.: GB920020093US1

IN RE APPLICATION OF:

HENRY E. BUTTERWORTH ET AL.

SERIAL NO.: 10/660,043

FILED: ***SEPTEMBER 10, 2003***

FOR: **FAST AND ECONOMICAL
ESTABLISHMENT OF REMOTE
COPY**

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EXAMINER:

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CONFIRMATION NO.: 5777

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ART UNIT: 2188

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APPEAL BRIEF UNDER 37 C.F.R. 1.192

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P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This Appeal Brief is submitted in support of the Appeal of the above-identified patent application.

REAL PARTY IN INTEREST

The real party in interest in the present Application is International Business Machines Corporation, the Assignee of the present Application as evidenced by the Assignment of record.

RELATED APPEALS AND INTERFERENCES

There are no Appeals or Interferences known to Appellants, the Appellants' legal representative, or assignee, which would be directly affected or have a bearing on the Board's decision in the present Appeal.

STATUS OF CLAIMS

Claims 1-22 stand finally rejected by the Examiner as noted in the Final Office Action dated May 8, 2006. The rejection of each pending claim is appealed.

STATUS OF AMENDMENTS

No amendments to the claims have been made subsequent to the final rejection that led to this appeal.

SUMMARY OF THE CLAIMED SUBJECT MATTER

The invention recited in Claim 1 provides a storage apparatus operable as primary in a remote copy pair (Figure 2, reference numeral 200; page 13, lines 20-23). The storage apparatus includes a remote copy component operable to establish a remote copy relationship between the primary, storing a primary copy, and a secondary, storing a secondary copy. (Figure 2, reference numerals 200, 210, 214; page 13, lines 20-23) A copy component operable at the primary creates a tertiary copy for download onto a portable physical storage medium for offline transport to the secondary for upload. (Figure 2, reference numerals 202, 212; page 12, lines 18-25) A synchronization component synchronizes data at the secondary with data at the primary

using an online link, in response to a request for synchronization from the secondary (Figure 2, reference numerals 220 and 224; page 14, lines 13-20). A metadata component stores a dirty state indicator of a portion of a storage space at the primary after establishment of the remote copy relationship at the primary, where the metadata component limits synchronization of the secondary copy when uploading the tertiary copy from the portable physical storage medium at the secondary to the portion of storage having the dirty state indicator at the primary (Figure 2, reference numerals 222; page 14, lines 20-26).

Appellants' Claim 8 recites a method of operating a storage apparatus as primary in a remote copy pair. According to this method, the storage apparatus includes a remote copy component that establishes a remote copy relationship between the primary, storing a primary copy, and a secondary, storing a secondary copy. (Figure 3, blocks 302 and 304; page 15, line 25 to page 16, line 20) A copy component operable at the primary creates a tertiary copy for download onto a portable physical storage medium for offline transport to the secondary for upload. (Figure 3, blocks 304 and 306; page 16, lines 7-23) A synchronization component synchronizes data at the secondary with data at the primary using an online link, in response to a request for synchronization from the secondary (Figure 3, blocks 310 and 312; page 16, lines 22-25). A metadata component stores a dirty state indicator of a portion of a storage space at the primary after establishment of the remote copy relationship at the primary, where the metadata component limits synchronization of the secondary copy when uploading the tertiary copy from the portable physical storage medium at the secondary to the portion of storage having the dirty state indicator at the primary (Figure 3, blocks 314 and 316; page 17, lines 5-15).

Appellants' Claim 13 recites a computer program product comprising computer program code tangibly embodied in a computer-readable storage medium to, when loaded into a computer system and executed thereon, cause the computer system to operate a storage apparatus as primary in a remote copy pair. According to the computer program product, the storage apparatus includes a remote copy component that establishes a remote copy relationship between the primary, storing a primary copy, and a secondary, storing a secondary copy. (Figure 3, blocks 302 and 304; page 15, line 25 to page 16, line 20) A copy component operable at the primary creates a tertiary copy for download onto a portable physical storage medium for offline

transport to the secondary for upload. (Figure 3, blocks 304 and 306; page 16, lines 7-23) A synchronization component synchronizes data at the secondary with data at the primary using an online link, in response to a request for synchronization from the secondary (Figure 3, blocks 310 and 312; page 16, lines 22-25). A metadata component stores a dirty state indicator of a portion of a storage space at the primary after establishment of the remote copy relationship at the primary, where the metadata component limits synchronization of the secondary copy when uploading the tertiary copy from the portable physical storage medium at the secondary to the portion of storage having the dirty state indicator at the primary (Figure 3, blocks 314 and 316; page 17, lines 5-15).

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

The Examiner's rejection of Appellants' Claims 1-5, 8-22 under 35 U.S.C. § 102(e) as being anticipated by *Ohran* (U.S. Patent No. 5,835,953) is to be reviewed on Appeal. The decision on this rejection will also be dispositive of the rejection of Claims 6-7 under 35 U.S.C. § 103(a) in view of *Kamvysselis* (U.S. Patent No. 6,941,429).

ARGUMENT

Rejection of Claims 1-5 and 8-22 under 35 U.S.C. § 102(e)

In Examiner's Final Office Action, Claims 1-5 and 8-22 are rejected under 35 U.S.C. § 102(e) as being anticipated by *Ohran* (U.S. Patent Number 5,835,935). The Examiner's rejection should be reversed because *Ohran* does not teach or suggest each feature of exemplary Claim 1, with each feature arranged as in the claim under review. According to *In re Bond*, 910 F.2d 831, 15 USPQ 2d 1566 (Fed. Cir. 1990), "[f]or a prior art reference to anticipate in terms of 35 U.S.C. § 102, every element of the claimed invention must be identically shown in a single reference . . . These elements must be arranged as in the claim under review."

Referring to exemplary Claim 1, the inventive combination of the claimed invention includes the following elements:

- (1) Three full copies of data: a “primary copy”, a “secondary copy”, and a “tertiary copy”;
- (2) A metadata component operable to store a dirty state indicator at the primary computer system;
- (3) A portable physical medium, storing the tertiary copy, which is transported offline from the primary computer system to the secondary computer system; and
- (4) An online link for the secondary computer system to access the metadata component stored on the primary computer system to limit synchronization of the secondary copy when uploading the tertiary copy from the portable physical storage medium at the secondary to the portion having a dirty state indicator at the primary.

Ohran discloses multiple embodiments that incorporate certain of the aforementioned elements, but no single embodiment of *Ohran* teaches or suggests the arrangement of the elements set forth in exemplary Claim 1 as required for a § 102 rejection by In re Bond.

First, col. 1, lines 45-52 and col. 2, lines 25-30 of *Ohran* disclose a system that utilizes magnetic tape to download data from a computer system for storage at a geographically safe distance from the computer system. Elements of Claim 1 that are omitted from this embodiment of *Ohran* include the tertiary full copy of data (Element 1), a metadata component (Element 2), and utilization of an online link (Element 4).

Second, col. 1, lines 45-52 and col. 2, lines 25-30 of *Ohran* also disclose a system that utilizes magnetic tape to download data from a computer system for storage at a geographically safe distance from the computer system and, in the event the computer system fails, downloads the data from the magnetic tape to a second computer system. Elements from Claim 1 that are omitted from this embodiment of *Ohran* include a metadata component (Element 2) and the utilization of the online link (Element 4)


Third, at col. 5, line 20 to col. 6, line 52, *Ohran* discloses a system that includes a primary system and a secondary system that tracks changes made to the primary. The system takes a static snapshot of the primary system and the changes are transferred to the backup system via a low-bandwidth communication link. Elements of Claim 1 that are omitted from this embodiment of *Ohran* include the tertiary full copy (Element 1) and the portable physical storage medium (Element 3).

As seen from the foregoing analysis, none of the embodiments disclosed in *Ohran* arrange all four of the above-linked elements of Claim 1 explicitly as set forth in Claim 1 as required for a § 102 rejection by In re Bond. Further, nothing in *Ohran* teaches or suggests the claimed invention or provides any motivation or suggestion to modify any of *Ohran*'s multiple embodiments to obtain the claimed invention.

CONCLUSION

In view of the foregoing arguments, Appellants submit that independent Claim 1, similar Claims 8, 13, 18, and all dependent claims are not anticipated by *Ohran*, and the Examiner's rejections under 35 U.S.C. § 102(e) and § 103(a) should be reversed. Please charge any necessary fees, and credit any overpayments, in association with the submission of this brief or otherwise necessary to further prosecution of the above-identified application to **IBM Corporation Deposit Account No. 09-0449**.

Respectfully submitted,



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CLAIMS APPENDIX

1. A storage apparatus operable as primary in a remote copy pair comprising:
 - a remote copy component operable to establish a remote copy relationship between said primary, storing a primary copy, and a secondary, storing a secondary copy;
 - a copy component operable at said primary to create a tertiary copy for download onto a portable physical storage medium for offline transport to said secondary for upload;
 - a synchronization component for synchronizing data at said secondary with data at said primary using an online link in response to a request for synchronization from said secondary;
 - a metadata component operable to store a dirty state indicator of a portion of a storage space at said primary after establishment of said remote copy relationship at said primary; and
 - said metadata component being operable to limit synchronization of said secondary copy when uploading said tertiary copy from said portable physical storage medium at said secondary to said portion of storage having said dirty state indicator at said primary.
2. A storage apparatus as claimed in claim 1, wherein said metadata component comprises a bitmap and said portion of said storage space is a grain of data.
3. A storage apparatus as claimed in claim 1, further operable as a secondary in a remote copy pair and comprising:
 - a loading component for uploading said tertiary copy from said portable physical storage medium;
 - a suppressing component for suppressing synchronization from a metadata component in said secondary; and
 - a requester component for requesting synchronization of data at said secondary with data at said primary using an online link.
4. A storage apparatus as claimed in claim 1, wherein said online link comprises a storage area network.

5. A storage apparatus as claimed in claim 1, wherein said copy component comprises a Flash Copy component.

6. A storage adapter card comprising a storage apparatus as claimed in claim 1.

7. A storage virtualization engine comprising a storage adapter card as claimed in claim 6.

8. A method of operating a storage apparatus as primary in a remote copy pair comprising the steps of:

establishing a remote copy relationship between said primary, storing a primary copy, and a secondary, storing a secondary copy;

creating a tertiary copy of a storage space for download onto a portable physical storage medium for offline transport to said secondary for upload;

synchronizing data at said secondary with data at said primary using an online link in response to a request for synchronization from said secondary;

storing, in a metadata component, a dirty state indicator of a portion of a storage space at said primary after establishment of said remote copy relationship at said primary; and

said metadata component being operable to limit synchronization of said secondary copy when uploading said tertiary copy from said portable physical storage medium at said secondary to said portion of storage having said dirty state indicator at said primary.

9. A method as claimed in claim 8, wherein said metadata component comprises a bitmap and said portion of said storage space is a grain of data.

10. A method as claimed in claim 8, wherein said storage apparatus is further operable as a secondary in a remote copy pair and comprising steps of:

uploading said tertiary copy from said portable physical storage medium;

suppressing synchronization from a metadata component in said secondary; and

requesting synchronization of data at said secondary with data at said primary using an online link.

11. A method as claimed in claim 8, wherein said online link comprises a storage area network.

12. A method as claimed in claim 8, wherein said step of creating a tertiary copy of a storage space comprises using a Flash Copy component.

13. A computer program product comprising computer program code tangibly embodied in a computer-readable storage medium to, when loaded into a computer system and executed thereon, cause said computer system to operate a storage apparatus as primary in a remote copy pair by performing the computer program code steps of:

establishing a remote copy relationship between said primary, storing a primary copy and a secondary, storing a secondary copy;

creating a tertiary copy of a storage space for download onto a portable physical storage medium for offline transport to said secondary for upload;

synchronizing data at said secondary with data at said primary using an online link in response to a request for synchronization from said secondary;

storing, in a metadata component, a dirty state indicator of a portion of a storage space at said primary after establishment of said remote copy relationship at said primary; and

limiting, by said metadata component, synchronization of said secondary copy when uploading said tertiary copy from said portable physical storage medium at said secondary to said portion of storage having said dirty state indicator at said primary.

14. A computer program product as claimed in claim 13, wherein said metadata component comprises a bitmap and said portion of said storage space is a grain of data.

15. A computer program product as claimed in claim 13, wherein said storage apparatus is further operable as a secondary in a remote copy pair and comprising further computer program code steps of:

uploading said tertiary copy from said portable physical storage medium;

suppressing synchronization from a metadata component in said secondary; and

requesting synchronization of data at said secondary with data at said primary using an online link.

16. A computer program product as claimed in claim 13, wherein said online link comprises a storage area network.

17. A computer program product as claimed in claim 13, wherein said computer program code step of creating a tertiary copy of a storage space comprises using a Flash Copy component.

18. A method of deploying a computerized business continuity service by operating a customer storage apparatus as primary in a remote copy pair comprising the steps of:

establishing a remote copy relationship between said primary, storing a primary copy and a secondary, storing a secondary copy;

creating a tertiary copy of a storage space for download onto a portable physical storage medium for offline transport to said secondary for upload;

synchronizing data at said secondary with data at said primary using an online link in response to a request for synchronization from said secondary;

storing, in a metadata component, a dirty state indicator of a portion of a storage space at said primary after establishment of said remote copy relationship at said primary; and

said metadata component being operable to limit synchronization of said secondary copy when uploading said tertiary copy from said portable physical storage medium at said secondary to said portion of storage having said dirty state indicator at said primary.

19. A method as claimed in claim 18, wherein said metadata component comprises a bitmap and said portion of said storage space is a grain of data.

20. A method of deploying a computerized business continuity service as claimed in claim 18, wherein a supplier storage apparatus is operable as a secondary in a remote copy pair and comprising steps of:

uploading said tertiary copy from said portable physical storage medium;

suppressing synchronization from a metadata component in said secondary; and

requesting synchronization of data at said secondary with data at said primary using an online link.

21. A method of deploying a computerized business continuity service as claimed in claim 18, wherein said online link comprises a storage area network.

22. A method of deploying a computerized business continuity service as claimed in claim 18, wherein said step of creating a tertiary copy of a storage space comprises using a Flash Copy component.

EVIDENCE APPENDIX

Other than the Office Action(s) and reply(ies) already of record, no additional evidence has been entered by Appellants or the Examiner in the above-identified application which is relevant to this appeal.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings as described by 37 C.F.R. §41.37(c)(1)(x) known to Appellants, Appellants' legal representative, or assignee.